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PREFACE

The *Systematized Nomenclature of Pathology* has been developed over a six-year period by the Committee on Nomenclature and Classification of Disease of the College of American Pathologists. Its primary aim is to help pathologists organize and utilize their material. We hope the code is sufficiently comprehensive and flexible to be useful to others interested in storage and retrieval of medical data.

The assistance of the pathologists in the United States and other countries who participated in the field trial of SNOP is gratefully acknowledged. Their criticisms and suggestions led to major revisions. The Committee also is particularly indebted to the personnel of the American Cancer Society for their contributions in the preparation of both the field trial edition and the present volume. The basic principles of the structure of this classification were conceived independently by E. Cuyler Hammond and Harold F. Dorn*.

Finally, special acknowledgement should be made of the contributions of Constance L. Percy, Sheldon C. Sommers, and Louis B. Thomas of this Committee. Beyond their general participation, they served as the editorial subcommittee for the present edition as well as the field trial version, and devoted many hours of tedious effort in checking and rechecking each term and number in the code. Miss Penelope Brower was our VariTypist.

Many books in all fields of medicine and biology were drawn upon in developing SNOP. The following were the principal references consulted in *editing* the first edition:

AMERICAN DRUG INDEX 1964. Charles O. Wilson and Tony Everett Jones. *J. B. Lippincott Company*, Philadelphia and Montreal, 1964.

ATLAS OF TUMOR PATHOLOGY. Subcommittee on Oncology of the National Research Council, Washington, D.C., 1952 et seq.

CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS. Acute Poisoning (Home and Farm). Marion N. Gleason, Robert E. Gosselin and Harold C. Hodge. *The Williams and Wilkins Company*, Baltimore, 2nd ed., 1963.

COLLEGE ZOOLOGY. Robert W. Hegner and Karl A. Stiles. *The MacMillan Company*, New York, 7th ed., 1959.

MORRIS' HUMAN ANATOMY. Ed. J. Parsons Schaeffer, *Blakiston Company*, Philadelphia, 10th ed., 1942.

NOMINA ANATOMICA. International Anatomical Nomenclature Committee. *Excerpta Medica*, Amsterdam, 2nd ed., 1961.

PRINCIPLES OF INTERNAL MEDICINE. T. R. Harrison, Raymond D. Adams, Ivan L. Bennett, William H. Resnik. George W. Thorn and M. M. Wintrobe. *The Blakiston Division, McGraw-Hill Book Company, Inc.*, New York, 4th ed., 1962.

REPORT OF THE COMMISSION ON ENZYMES OF THE INTERNATIONAL UNION OF BIOCHEMISTRY. *Pergamon Press*, New York, 1961.

STANDARD NOMENCLATURE OF DISEASES AND OPERATIONS. Edward T. Thompson and Adeline C. Hayden. Published for the American Medical Association, *McGraw-Hill Book Company, Inc.*, New York, 5th ed., 1961.

STEDMAN'S MEDICAL DICTIONARY. *The Williams and Wilkins Company*, Baltimore, 20th ed., 1961 (reprinted May 1962).

Recently the Section on Pathology of the Council of International Organizations of Medical Sciences of the United Nations has recommended the adoption of SNOP for their classification of clinical and anatomical pathology. The College offered SNOP without reservations or restrictions.

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Chairman

**Deceased*

INTRODUCTION

STRUCTURE OF THE CODE

Diseases may be defined in terms of four areas of information: 1) the part of the body affected (Topography); 2) the structural changes produced (Morphology); 3) the etiologic agent (Etiology); and 4) the functional manifestations (Function). This code is divided into *four* separate, interdependent *fields* comparable to these areas: Topography, Morphology, Etiology, and Function. Within a field, terms are assigned a four-digit number. The first (left hand) digit indicates the section of the field. The other numbers indicate progressively finer subdivisions. These groupings reflect, as far as possible, natural relations. This structure and organization are given in the Table of Contents and numeric portions of the code. An alphabetic listing of terms is included to permit coding. Each field is described further.

Topography. The topographic field is given both in two-digits, adequate for the needs of most pathologists, and as a four-digit expansion of the basic two-digit code for those desiring greater anatomic detail. To permit moderate completeness within a two-digit format the code was expanded here by use of X's and Y's (corresponding to 11 and 12 punches in a punch card). The topographic field includes codes for secretions and cytologic material as purely anatomic terms to facilitate coding of cytologic reports. It is possible to use the four-digit portion of the code where detail is desired and the two-digit portion for the remainder of Topography in departments with specialized material or individual interest. The terminology employed is the preferred terminology given in *Nomina Anatomica* translated into English.

Morphology. Morphology, a four-digit field, includes structural alterations ranging from gross observations to intracellular ultrastructural changes and is intended to encompass all possible discernible abnormalities. SNOP as a whole is based upon morphologic changes as the primary concept. Hence retrieval of all examples of a class of tissue response was made possible, independent of site or etiologic agent. For example, all types of granulomatous inflammation are assigned four-digit numbers beginning with 44. It is not necessary to search every possible specific granulomatous lesion to retrieve them. It is important to realize, however, that while each morphologic concept has a separate number, full terminologic specificity is usually conferred only by the combination of the morphologic and topographic fields. M-4000 is the code for "Inflammation, not otherwise specified", but when used with T-67, the code for "Colon", the combination 67-4000 becomes "Colitis". The terms in the morphologic field are divided into nine sections as shown in the Table of Contents. These include congenital abnormalities and effects of mechanical energy as well as other classes of morphologic alteration. Code numbers also have been assigned

for the absence of morphologic alteration (to correspond with "no pathological diagnosis") and for the absence of residual tumor since one may wish to code these negative diagnoses.

In Section 4 of Morphology, Inflammation and Fibrosis, the second and third digits have specific meanings as given below and on page 88.

2nd and 3rd DIGIT CODES FOR INFLAMMATION APPLY TO CODE NUMBERS 400 – 449

2nd DIGIT CODE NO.	3rd DIGIT CODE NO.	
0 – NOS (*i.e.* none of the adjectives listed below)	0 – NOS (*i.e.* none of the adjectives listed below)	5 – Fibrinous
1 – Acute	1 – Focal	6 – Hemorrhagic
2 – Subacute	2 – Diffuse	7 – Necrotizing
3 – Chronic	3 – Serous	8 – Vesicular
4 – Granulomatous	4 – Exudative	9 – Miscellaneous

These provide for certain adjectives commonly used in connection with inflammation and repair. In this system, the term "Cervicitis" with no modifying adjectives (NOS) is coded 83-4000. The second and third digits are zero because no modifying adjectives are given (NOS). When adjectives are present, the number is changed accordingly. "Acute cervicitis" is not listed separately as such, but should be assigned the number 83-4100. "Focal cervicitis" is coded 83-4010; "Acute focal cervicitis" should be coded 83-4110; and "Chronic cervicitis, NOS" is 83-4300. Other combinations of adjectives are seen in "Acute hemorrhagic pancreatitis" (59-4160) or "Necrotizing granulomatous inflammation of lymph node" (08-4470). However out of the almost infinite number of permutations possible, only a few of the most common inflammation types could be listed specifically in SNOP. The rest are left to be handled by the coder.

In Morphology Sections 8 and 9, Neoplasms, the fourth digit has specific meanings as given below and on page 115: For example, since 0 in

4th DIGIT CODE FOR NEOPLASMS, EXCEPT LEUKEMIAS, APPLIES TO CODE NUMBERS 800 – 979

4th DIGIT CODE NO.	
0 . . .	Benign
1 . . .	Uncertain whether benign or malignant
2 . . .	Carcinoma-in-situ
3 . . .	Malignant, primary site
6 . . .	Malignant, metastatic site
9 . . .	Malignant, uncertain whether primary or metastatic site

4th DIGIT CODE FOR LEUKEMIAS APPLIES TO CODE NUMBERS 980 – 993

4th DIGIT CODE NO.	
3 . . .	Leukemia, NOS
5 . . .	Acute
7 . . .	Chronic
9 . . .	Subleukemic and aleukemic

the fourth digit means benign, the code number for "Adenoma, benign" is 8140; since 3 in the fourth digit means malignant, "Adenocarcinoma, NOS" is 8143 and "Metastatic adenocarcinoma" should be coded 8146. Not all possible neoplasms are listed. "Hilar cell tumor" is listed only in its benign form, 87-8660. If a "Malignant hilar cell tumor" is found it should be designated 87-8663 even though there is no specific listing of this specific term and number.

Etiology. The etiologic field includes not only the various pathogenic organisms but physical agents of injury and a listing of chemicals and drugs, in Sections 5 – 8, that may be the cause of abnormalities in man. Because of the fact that most pathologists have relatively few occasions to code chemicals and drugs as etiologic agents, however, alphabetic listing of these agents is separate from the general alphabetic index of the code.

Function. The functional field of the SNOP code covers a number of areas that represent physiological or chemical disorders or alterations. It includes a number of items that are signs and symptoms of disease as well as disturbances in biochemical and enzyme factors of interest to the clinical pathologist. The enzyme disorders in Section 3 also are given a separate alphabetic listing. In addition to the abnormal functional states included in the field, a number of normal states are also given code numbers because of their importance or frequency of usage, for example "Pregnancy, third trimester", F-0104.

The Function field also includes a list of complex disease entities. Many of these have specific morphologic changes and many are due to specific etiologic agents. They still are included as entities in the Function field to permit full coding clarity and specificity. With them it becomes possible to distinguish among 1) the presence of morphologic changes with and without functional evidence of the disease, 2) the presence of a disease state when the usual morphologic picture is lacking, and 3) the presence of a specific disease entity with or without the demonstration of the causative agent. For example, a patient may die of "Typhoid fever", F-9497 with or without the demonstration of "Salmonella typhi". If the organism is not found, just F-9497 is coded. If the organism is present, both F-9497 and E-1361 are coded. Sometimes only "Salmonella typhi" is demonstrated and that would just be coded E-1361. On the other hand, if "Ulceration of the ileum" were found in a patient, but the organism was not demonstrated, and the rest of the disease complex was not seen, the full coding would be 65-4003 for Topography and Morphology.

The principal purpose of coding the various manifestations of disease is to make retrieval of case records, tissue slides, photographs, etc., efficient. For this some may need the entire SNOP nomenclature; for others simple, broad groupings may suffice. For anatomic pathologists, the Function

field should greatly assist coding of the principal and contributing causes of death. The code was designed so that the autopsy summary need not be limited to the fields of Topography and Morphology, and can include, in retrievable form, postmortem and antemortem laboratory findings and other pertinent clinical observations.

A major objective of SNOP is to have each term or entity listed in only one location to insure complete data retrieval. For this reason, a single number has been assigned to all terms considered synonymous. In the numeric portion of the code the synonyms are *indented* beneath the first term. Also indented are some diagnoses representing "site-specific synonyms". For example, the number 3850 in the morphologic field means "Hemorrage". Indented below is "Hematuria", a site-specific hemorrhage, separable from hemorrhage into other sites by the Topography code for urine.

It will also be noted that the same number has been given to more than one non-indented term. This manner of listing occurs in two different situations. First, the terms, while not synonymous, may be regarded as equivalent.

4475 Tuberculid, NOS
Erythema induratum
Papulonecrotic tuberculid
Rosacea-like tuberculid

In the morphologic field, number 4475 is assigned to four primary terms as shown above. These are not synonyms but are equivalent in that they represent cutaneous manifestations of a tuberculous process elsewhere in the body. Secondly, several primary terms also occur together in some portions of the 4-digit Topography. Here terms listed below the first may represent further subdivisions that are to be coded with the more general term. This occurs primarily in the part dealing with the nervous system, as exemplified by the Topography number X257 for "Hippocampus". This number also is assigned to the terms "Alveus", "Dentate gyrus", and "Fimbriodentate sulcus", all parts of the hippocampus.

In order to adhere to the principle of listing each concept in only one location, arbitrary decisions were unavoidable. Sometimes a given condition could be listed equally well in more than one place in the code. In other instances there is controversy over the basic nature of a lesion. An example of the former problem is "Wilson's disease". It could be regarded as a synonym of the Function term "Copper disorder" 1290 or "Ceruloplasmin disorder" 1293 as well as of the Morphology term "Hepatolenticular degeneration" 5053 where it actually was placed. The value of having a term listed only once is believed to outweigh possible objections to some of the decisions.

SYMBOLS

Abbreviations have been avoided as much as possible. The prefixes T (Topography); M (Morphology); E (Etiology) and F (Function) are used to denote the field to which a given code number belongs. These field designations are found in the alphabetic listing and in certain parts of the morphologic field within the numerical listing. Within Morphology, for example, terms that belong only to a single site are followed by the first two digits of the T-number: "M-4000 Cervicitis (T-83)". Similarly whenever a morphologic term is associated with a specific etiologic agent, the appropriate E-number is listed in parentheses: "M-4000 Pneumonia, staphylococcal (T-28) (E-1600)". Inclusion of the T and E-numbers was felt desirable to save time and increase the accuracy of coding.

The other common abbreviation used in the code is NOS for "Not Otherwise Specified". NOS is printed only after those unmodified terms that also appear elsewhere in the code with some modifying word or phrase. For example, the unqualified term "Abortion", is listed as "Abortion, NOS", M-2630. The code number for "Artificial abortion" is M-2632, for "Complete abortion" M-2633, etc. If a term includes an adjective that is not included in the code, for example, "Accidental abortion", the term is coded as "Abortion, NOS", M-2630.

METHODS OF MAINTAINING RECORDS

SNOP provides code numbers for indexing and analyzing pathological findings. To deal with these numbers, any one of several clerical or mechanical systems may be employed.

In choosing a system, first consideration must be given to the use the pathologist will make of the system once it is established, that is, his needs for "data retrieval". Secondly, consideration should be given to the cost and difficulty of establishing and maintaining the system. This is the problem of "data entry". Third consideration should be given to the "storage" of the data. These three elements should be balanced one against the other. In some hospitals so much time and money are spent on "data entry", *i.e.* keeping up files and lists, that little opportunity is left for making use of the material. In other hospitals, so little attention is given to "data entry" and "data storage" that the record system is almost useless. Therefore, each pathologist should choose a system adequate for his needs in respect to "data retrieval", but not unnecessarily elaborate, time consuming and costly from the standpoint of "data entry" and "data storage".

It is assumed that most pathologists wish to maintain a classified index of their findings in surgical specimens and autopsies. Those who do not intend to make any extensive analyses of their data may well employ a simple, inexpensive method of indexing. Those who have a large volume of data and who plan to use it for research purposes will require a more elaborate system.

Every pathological finding of interest first must be identified by the code numbers provided for this purpose in SNOP. This step must be taken regardless of what system is used for indexing or analytical purposes. The code numbers may be entered directly on the laboratory copy of the original report. If there are two or more findings on the same specimen, then all that are important must be coded. This procedure is easy and also checking is most accurate when the code numbers are written on the laboratory copy of the original record.

Perhaps the simplest of all systems is to make one index card for each type of pathological finding. The topographic site, its code number, the morphologic manifestation and the corresponding morphologic code number, or the functional or etiologic terms and code numbers, are typed at the top of the card. (See Figure 1.) The specimen number, slide number, or autopsy number is written on the card each time this finding occurs. The cards are filed in order by topographic number, and for convenience, a tab card is inserted between sets of index cards for different topographic sites.

T-63 Stomach		Peptic Ulcer	M-4003
S-62-6			
A-62-315			
S-62-429			
S-62-536			
S-62-647			
A-62-693			
S-62-704			
S-62-743			

Figure 1

To begin such a file, it is well to prepare one card for each common pathological finding since these cards are sure to be needed. Later, a new card is made each time a finding occurs for which no card has previously been made.

The major advantage of this system is its economy. Two disadvantages are: 1) Since there are thousands of types of pathological findings, eventually there will be thousands of cards, many of which may contain only one entry. 2) The specimen is identified but the patient is not, and there may be several different specimens from the same patient, all with the same findings. To overcome the latter difficulty an additional column can be added to the index card that gives the patient's name or unit record number. This increases the usefulness of the file; but, of course, it increases the complexity and expense.

A punch card system is of particular value to pathologists who have a large volume of material and who wish to analyze it either for research or administrative purposes. Any type of cross tabulations and counts can easily be made. Furthermore, a large number of punch cards can be quickly duplicated. Thus it is possible to have several duplicate sets of cards, each arranged in the order most suitable for some particular purpose.

If punch cards are decided upon, a system should be designed that provides all the information needed; but which is no more detailed and complicated than is required. A few pathologists in large research institutions might have a complete punch card installation for their own exclusive use; and some may make use of modern high speed computers. They should seek advice from experts in data processing before making such a decision.

Companies engaged in selling supplies and equipment for record keeping have devised various types of cards, files, and machinery. These range all the way from copyrighted printed material to multi-million dollar computers. It is not within the scope of this volume to discuss the advantages of these products. It does appear, however, that SNOP is compatible with most systems and, in fact, provides a powerful way of making them useful to the pathologist.

FUTURE PLANS

The Committee expects to maintain a continued operation of collecting and classifying new information that can be integrated into SNOP. It is also interested in correcting errors of omission and commission. All suggestions, corrections and criticisms should be forwarded to the Chairman, Committee on Nomenclature and Classification of Disease, College of American Pathologists, Suite 2115 Prudential Plaza, Chicago, Illinois 60601.

Another major interest of the Committee concerns methods of use of SNOP. Workshops dealing with its use in installations of various types and sizes are planned for future meetings of the College, in conjunction with other more general programs on methods of data collection, storage and re-

trieval. The users of SNOP must be a major source of proposals, suggestions and assistance in this area. The Committee is most anxious to learn of particular problems and their solutions. Retrieval experiences are of special interest.

It is hoped to coordinate this system of classification with those appropriate for other special medical situations. Once there is a satisfactory, uniform code for terms in pathology, such coordination would make it possible to utilize accumulations of material for study from the entire United States or hopefully the world. This is the ultimate goal of the Committee in the field of pathology nomenclature.